



United States
Department of
Agriculture

Forest
Service

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Reply To: 3400/2470

Date: August 30, 1991

Subject: Results of Biological Evaluation of the Rock Camp area,
Arrowhead Ranger District, San Bernardino National Forest
(FPM Rept. No R91-10)

To: Forest Supervisor, San Bernardino National Forest

On July 9, 1991 James Allison and Susan Frankel, plant pathologists, visited Rock Camp (T.3N., R.3W., S.1 E 1/2) to investigate the cause of reported high levels of conifer mortality in that area. The district wanted to have the pests identified so they can assess management options in the Willow Resource Plan/Environmental Assessment. Accompanying the pathologists were Mary Ann Keller, resources officer, Michael Pond, forester, Arrowhead Ranger District and Ernest DelRio, silviculturist, South Zone. This memo briefly describes stand conditions and concludes that drought stress and insect activity is the cause of observed mortality. Pest management considerations in this area are outlined.

Formerly an equestrian camp and guard station, the site at 4800 feet is currently abandoned. The site supports a mixed-species stand of predominantly 8"-20" DBH Coulter pine (Pinus coulteri) with large (>25" DBH) Jeffrey pine (Pinus jeffreyi), black oak (Quercus kelloggii) and canyon live oak (Quercus chrysolepis) scattered throughout. Stand basal area averages 120 sq. feet/ac., ranging from 60 to 160 sq. feet/ac. Manzanita, wild rose and grass with some Coulter pine and oak seedlings comprise the understory. An intermittent creek is present below the affected area. The area has been grazed and thinned. Small (<10" diameter) Coulter pine stumps and a few larger (>25" diameter) Jeffrey pine stumps are present.

Patches of mortality containing a few dozen dead-standing trees are interspersed over the approximately 5 acres observed. Large Jeffrey pine are dead, adjacent to more recently killed Coulter pine. A few trees have broken off at 2 feet in height and contain brown cubical decay; others have broken tops. Two trees were windthrown but roots contained brown cubical decay and no evidence of Annosus root disease was found. No black stain root disease was found on site but blue stain was common. Jeffrey pine beetle (Dendroctonus jeffreyi) galleries and loose bark were present on many of the standing dead Jeffrey pine trees. The Coulter pine are infested with western pine beetle (Dendroctonus brevicornis). Resin production on insect-attacked trees was weak, indicative of their stressed condition.

The observed mortality appears to be due to drought stress followed by bark beetle activity. Root diseases were not active or evident on site. Management alternatives include: 1) No action; 2) planting oak; 3) planting oak and





thinning the surrounding Coulter and Jeffrey pine; 4) planting Coulter pine and Jeffrey pine and maintaining a low basal area in the stand. In alternatives that advise thinning it is recommended that basal area be maintained at 90 sq. feet/acre. If no action is taken, tree mortality will continue. Planting oaks will provide replacement trees, but mortality will continue in adjacent Coulter and Jeffrey pine unless thinnings are done to reduce stand basal area. Planting oak, Coulter and/or Jeffrey pine and thinning the stand will result in vigorous trees which should be more resistant to bark beetle attack.

In all cases where trees are removed, slash should be lopped and scattered, then piled and burned in the fall to discourage bark beetle breeding and fuels build-up. This slash treatment is currently being implemented on the Arrowhead District. Some snags should be retained for wildlife habitat.

Mortality similar in appearance to the area at Rock Camp was observed in many other areas on the Arrowhead, Big Bear and San Jacinto Ranger Districts during the July 8-12, 1991 visit. Further studies would be useful to determine the extent of mortality and impact on resources. If you have questions or comments on this report please contact James Allison at 415-705-2565 or Susan Frankel at 415-705-2651.


JOHN NEISESS, FPM Program Leader
State and Private Forestry

cc: Mary Ann Keller, Arrowhead RD
Ernest Del Rio, SBNF SO (Big Bear RD)
Sandy Hogan, District Ranger, Arrowhead RD

S.Frankel va: 8/29/91

